great Intercourſe with *England*, might introduce ſome Greek Letters to expreſs thoſe Sounds which they had not in their own Language; from hence they were carried into *France*, with the reſt of the *Saxon* Alphabet, and ſo into *Italy*; which *Mabillon* alſo in effect acknowledges when he ſays, *Hanc tamen Scripturæ formam non* Franci à Romanis, *qui* Langobardicis *paſſim Elementis tunc utebantur, ſed à* Francis Romani *accepiſſe videntur.* But it would take up too much time here to diſcourſe of the Original of the *Saxon* Character, and whence thoſe Agreements between it and the pure *Merovingian* and *Lombard* Characters might at firſt ariſe; and perhaps the thing it ſelf does not deſerve any farther enquiry.

An Eſtimate of the Quantity of Vapour raiſed out of the Sea by the warmth of the Sun; derived from an Experiment ſhown before the Royal Society, *at one of their late Meetings: by* E. Halley.

THat the quantity of aqueous Vapours contained in the *Medium* of the Air, is very conſiderable, ſeems moſt evident from the great Rains and Snows which are ſometimes obſerved to fall, to that degree, that the Water thus diſcharged out of the Interſtices of the Particles of Air, is in weight a very ſenſible part of the incumbent Atmoſphere: but in what proportion theſe Vapours riſe, which are the Sources not only of Rains, but alſo of Springs or Fountains (as I deſign to prove) has not, that I know of, been any where well examined, tho it ſeem to be one of the moſt neceſſary Ingredients of a real and Philoſophical Meteorology; and as ſuch, to deſerve the conſideration of this Honourable Society. I thought it might not be unacceptable, to attempt, by Experiment to determine the quantity of the Evaporations of Water, as far as they ariſe from Heat; which, upon Tryal, ſucceeded as follows.

We took a Pan of Water, about 4 inches deep, and 7 inches $\frac{9}{10}$ diameter, in which we placed a Thermometer, and by means of a Pan of Coals, we brought the Water to the ſame degree of heat which is obſerved to be that of the Air in our hotteſt Summers; the Thermometer nicely ſhewing it. This done, we affixed the Pan of Water, with the Thermometer in it, to one end of the Beam of the Scales, and exactly counterpoiſed it with weights in the other Scale; and by the application or removal of the Pan of Coals, we found it very eaſie to maintain the Water in the ſame degree of Heat preciſely. Doing thus, we found the weight of the Water ſenſibly to decreaſe; and at the end of two hours we obſerved that there wanted half an ounce *Troy*, all but 7 grains, or 233 grains of Water, which in that time had gone off in Vapour; tho one could hardly perceive it ſmoak, and the Water were not ſenſibly warm. This Quantity in ſo ſhort a time ſeemed very conſiderable, being little leſs than 6 ounces in 24 hours from ſo ſmall a Surface as a Circle of 8 Inches diameter. To reduce this Experiment to an exact Calculus and determine the thickneſs of the skin of Water that had ſo evaporated, I aſſume the Experiment alledged by Dr. *Edward Bernard* to have been made in the *Oxford* Society, *viz.* That the Cube foot, *Engliſh*, of Water weighs exactly 76 pounds *Troy*; this divided by 1728, the number of inches in a foot will give 253$\frac{1}{3}$ grains, or $\frac{1}{2}$ ounce 13$\frac{1}{3}$ grains for the weight of a Cube inch of Water; wherefore the weight of 233 grains is $\frac{233}{253}$ or 35 parts of 38 of a Cube inch of Water. Now the Area of the Circle, whoſe Diameter is 7 $\frac{9}{10}$ inches, is 49 ſquare inches; by which dividing the quantity of Water evaporated, *viz.* $\frac{35}{38}$ of an inch, the Quote $\frac{35}{1862}$ or $\frac{1}{53}$ ſhews that the thickneſs of the Water evaporated, was the 53*d* part of an Inch: but we will ſuppoſe it only the ſixtieth part, for the facility of Calculation. If therefore Water as warm as the Air in Summer, exhales the thickneſs of a 60 part of an inch in two hours from its whole Surface, in twelve hours it will exhale the $\frac{1}{10}$ of an inch; which quantity, will be found abundantly ſufficient to ſerve for all the Rains, Springs and Dews, and account for the *Caſpian* Seas being always at a ſtand, neither waſting nor overflowing; as likewiſe for the Current ſaid to ſet always in, at the Streights of *Gibralter*, tho thoſe Mediterranean Seas receive ſo many and ſo conſiderable Rivers.

To eſtimate the quantity of Water ariſing in Vapour out of the Sea, I think I ought to conſider it only for the time the Sun is up, for that the Dews return in the Night, as much if not more, Vapours than are then emitted; and in Summer the Days being longer than twelve hours, this exceſs is ballanced by the weaker Action of the Sun, eſpecially when riſing, before the Water be warmed: ſo that if I allow $\frac{1}{10}$ of an inch of the Surface of the Sea to be raiſed *per diem* in Vapours, it may not be an improbable Conjecture.

Upon this Suppoſition, every 10 ſquare Inches of the Surface of the Water yields in Vapour *per diem* a Cube inch of Water; and each ſquare foot half a Wine-pint; every ſpace of 4 foot ſquare, a Gallon; a mile ſquare, 6914 Tons; a ſquare Degree, ſuppoſed of 69 *Engliſh* miles, will evaporate 33 Millions of Tons: and if the Mediterranean be eſtimated at 40 Degrees long and 4 broad, Allowances being made for the Places where it is broader by thoſe where it is narrower, (and I am ſure I gheſs at the leaſt,) there will be 160 ſquare Degrees of Sea; and conſequently, the whole Mediterranean muſt loſe in Vapour, in a Summers-day, at leaſt 5280 Millions of Tons. And this quantity of Vapour, tho very great, is as little as can be concluded from the Experiment produced: And yet there remains another Cauſe, which cannot be reduced to Rule, I mean the Winds, whereby the Surface of the Water is lick'd up ſometimes faſter than it exhales by the heat of the Sun; as is well known to thoſe that have conſidered thoſe drying Winds which blow ſometimes.

To eſtimate the quantity of Water the Mediterranean Sea receives from the Rivers that fall into it, is a very hard task, unleſs one had the opportunity to meaſure their Channels and Velocity; and therefore we can only do it by allowing more

than

than enough; that is, by aſſuming theſe Rivers greater than in all probability they be, and then comparing the quantity of Water voided by the *Thames*, with that of thoſe Rivers whoſe Water we deſire to compute.

The Mediterranean receives theſe conſiderable Rivers; the *Iberus*, the *Rhone*, the *Tiber*, the *Po*, the *Danube*, the *Neiſter*, the *Boryſthenes*, the *Tanais*, and the *Nile*, all the reſt being of no great note, and their quantity of Water inconſiderable. Theſe nine Rivers, we will ſuppoſe each of them to bring down ten times as much Water as the River *Thames*; not that any of them is ſo great in reality, but to comprehend with them all the ſmall Rivulets that fall into the Sea, which otherwiſe I know not how to allow for.

To calculate the Water of the *Thames*, I aſſume that at *Kingſton* Bridge, where the Flood never reaches, and the Water always runs down, the breadth of the Channel is 100 Yards, and its depth 3, it being reduced to an equality; (in both which Suppoſitions I am ſure I take with the moſt.) Hence the Profil of the Water in this Place is 300 ſquare Yards: this multiplied by 48 miles, (which I allow the Water to run in 24 hours, at 2 miles an hour) or 84480 Yards, gives 25344000 Cubick Yards of Water to be evacuated every day; that is, 20300000 Tons *per diem*; and I doubt not but in the exceſs of my meaſures of the Channel of the River, I have made more than ſufficient allowance for the Waters of the *Brent*, the *Wandel*, the *Lea*, and *Darwent*, which are all worth notice, that fall into the *Thames* below *Kingſton*.

Now if each of the aforeſaid 9 Rivers yield 10 times as much Water as the *Thames* doth, 'twill follow that each of them yields but 203 millions of Tons *per diem*, and the whole 9 but 1827 millions of Tons in a day; which is but little more than $\frac{1}{3}$ of what is proved to be raiſed in Vapour out of the Mediterranean in 12 hours time. Now what becomes of this Vapour when raiſed, and how it comes to paſs that the Current always ſets in at the mouth of the Streights of *Gibralter*, is intended, with leave, for a farther Entertainment

tainment of this Honourable Company: in the mean time, it it needful to advertiſe the Reader, that in making the Experiment herein mentioned, the Water uſed, had been ſalted to the ſame degree as is the common Sea-water, by the Solution of about a 40*th* part of Salt.

Obſervationes nonnullæ Eclipſeos Nuperæ Solaris, Maii 1. St. vet. diverſis in locis habitæ, ac cum Regiâ Societate Communicatæ.

HÆC *Eclipſis, etiamſi contemnendæ quantitatis fuerit, ac nudis oculis non omnino percipi potuerit, tamen ad accuratam determinationem Parallaxis & Latitudinis Lunæ maxime idonea videtur. Quapropter quas hactenus obtinere potuimus obſervationes cape Lector Benevole.*

Londini *ſeorſim obſervantibus* Hookio & Halleio; *Initii momentum, cælo licet puriſſimo, ob obliquam incidentiam Lunæ, debite definire non licuit. Sed hora* 1^{h}. 16′. *jam cæpta erat Eclipſis ſatis notabiliter: circa* 1^{h}. 40′. *prope medium Eclipſis, Chorda partis Eclipſatæ, ſive inter cornua, inventa eſt* 9′. 30″. *cui reſpondet arcus* 36 gr. *in diametro vero non niſi* 1′. 30″. *Finis conſenſu utriuſque obſervatoris contigit accurate hora* 2^{h}. 3′. 00.

Grenovici *in Obſervatorio Regio* Flamſteedius *eadem de cauſa Initium non vidit, finem vero determinavit* 2^{h}. 4′. 15″. *Medio Eclipſis ſive maximâ obſcuratione, Chorda partis Eclipſatæ erat* 9′. 54″.

Apud Totteridge *prope* Londinum *verſus Corum, finem videt Dominus* Haines, Reg. Soc. Soc. *ad* 2^{h}. 2′. *Quantitatem vero Maximam dimidii Digiti, ab Auſtro.*

In Inſula Barbada, *ad Oppidum* Bridge-Town, *ſub Lat.* 12 gr. 58′. *Finem habuit Dominus* Frank 1′. 30″. *temporis ante quam Solis Altitudo fuit* 31 gr. 47′. *ad ortum, hoc eſt hora* 7^{h}. 56′. 45″. A. M. *Quantitatem Maximam æſtimatione definivit duorum digitorum ab Auſtro.*